Supporting Information:

Identifying the charge generation dynamics in a Cs⁺-based triple cation mixed perovskite solar cells

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Fig. S1: Section profiles of CFM images: topography: (a,c,e) in dark, (b,d,f) under green light, and current: (a',c',e') in dark, (b',d',f') under green light- of $(MA_{0.15}FA_{0.85})Pb(I_{0.85}Br_{0.15})_3$, $Cs_{0.05}(MA_{0.15}FA_{0.85})_{0.95}Pb(I_{0.85}Br_{0.15})_3$ and Spiro-OMeTAD (90 mM) coated $Cs_{0.05}(MA_{0.15}FA_{0.85})_{0.95}Pb(I_{0.85}Br_{0.15})_3$ (all at 1.4 M perovskite concentrations). The x-axis dimensions are in μ m and the y-axis dimensions are in pA.



Fig. S2: Section profiles of KPFM images: Topography: (a,c,e) in dark, (b,d,f) under green light, and surface potential: (a',c',e') in dark, (b',d',f') under green light- maps of $(MA_{0.15}FA_{0.85})Pb(I_{0.85}Br_{0.15})_3$, $Cs_{0.05}(MA_{0.15}FA_{0.85})_{0.95}Pb(I_{0.85}Br_{0.15})_3$ and Spiro-OMeTAD (90 mM) coated $Cs_{0.05}(MA_{0.15}FA_{0.85})_{0.95}Pb(I_{0.85}Br_{0.15})_3$ (at 1.4 M perovskite concentrations). The x-axis dimensions are in μ m and the y-axis dimensions are in mV.



Fig. S3: Topography (a) and surface potential (a') of HOPG.



Fig. S4: Capacitance vs frequency at different illumination intensities. (a-d) 1.2M perovkites based devices varying the percentage of cesium added. (e-f) 1.4M perovkites based devices without and with 5% Cs.



Fig. S5: X-Ray difractogram of perovskite film and with 15% Cs content after 60 minutes under UV and relative high humidity conditions (60% RH).